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New species of the spider genus *Platocoelotes* Wang, 2002 (Araneae: Amaurobiidae)

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New species of the spider genus *Platocoelotes* Wang, 2002 (Araneae: Amaurobiidae). - Nine species from China, including four new species described in the current paper, are placed in the spider genus *Platocoelotes*. The new species are: *Platocoelotes daweishanensis* sp. n., *Platocoelotes globosus* sp. n., *Platocoelotes latus* sp. n. and *Platocoelotes paralatus* sp. n. A key and a distribution map for all nine species in this genus are provided.

Keywords: Taxonomy - morphology - cave adaptation - China.

INTRODUCTION

The spider genus *Platocoelotes* was established and revised by Wang in 2002 and 2003, respectively. Five valid *Platocoelotes* species were so far known, i.e. *P. impletus* (Peng & Wang, 1997), *P. icohamatoides* (Peng & Wang, 1997) and *P. polyptychus* Xu & Li, 2007 from Hunan, *P. kailiensis* Wang, 2003 from Guizhou, *P. lichuanensis* (Chen & Zhao, 1998) from Hubei (see Platnick, 2007). All these species are distributed in central and southwest China, which lie in the transition zone between the Palaearctic and the Oriental realms.

The current paper provides descriptions of four new *Platocoelotes* species, three of which were collected in caves, i.e. *P. globosus* sp. n., *P. latus* sp. n. and *P. paralatus* sp. n. These three new cave species all have simple and more or less rounded spermathecae, indistinct copulatory ducts, mesally situated epigynal hoods, a short cymbial furrow, and a single patellar apophysis. However, the presence of a ventral conductor apophysis on the male palp and the broad, shallow atrium in the female epigynum indicate that they are congeneric with the type species of *Platocoelotes*.

METHODS

Specimens were examined with an Olympus SZ40 stereomicroscope; details were studied with an Olympus BX41 compound microscope. All illustrations were made using an Olympus drawing tube. Male palps and female epigyna were examined and illustrated after being dissected from the spider bodies.

All measurements were obtained using an Olympus SZ40 stereomicroscope and are given in millimeters. Leg measurements are given as: Total length (femur, patella

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+ tibia, metatarsus, tarsus). Only structures (e.g., palp, legs) of the left body side were described and measured. The terminology used in text and figure legends follows Wang (2002). Abbreviations used in text and legends: A = atrium; ALE = anterior lateral eye; AME = anterior median eye; AME-ALE = distance between AME and ALE; AME-AME = distance between AME and AME; ALE-PLE = distance between ALE and PLE; C = conductor; CD = copulatory duct; CDA = dorsal conductor apophysis; CF = cymbial furrow; E = embolus; FD = fertilization duct; H = epigynal hood; LTA = lateral tibial apophysis; PA = patellar apophysis; PLE = posterior lateral eye; PME = posterior median eye; PME-PLE = distance between PME and PLE; PME-PME = distance between PME and PME; RTA = retrolateral tibial apophysis; S = spermatheca; SB = spermathecal base; SST = spermathecal stalk; ST = subtegulum; T = tegulum; TS = tegular sclerite. All types of the new species are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS), and in the Muséum d'histoire naturelle de Genève, Switzerland (MHNG).

TAXONOMY

Platocoelotes Wang, 2002

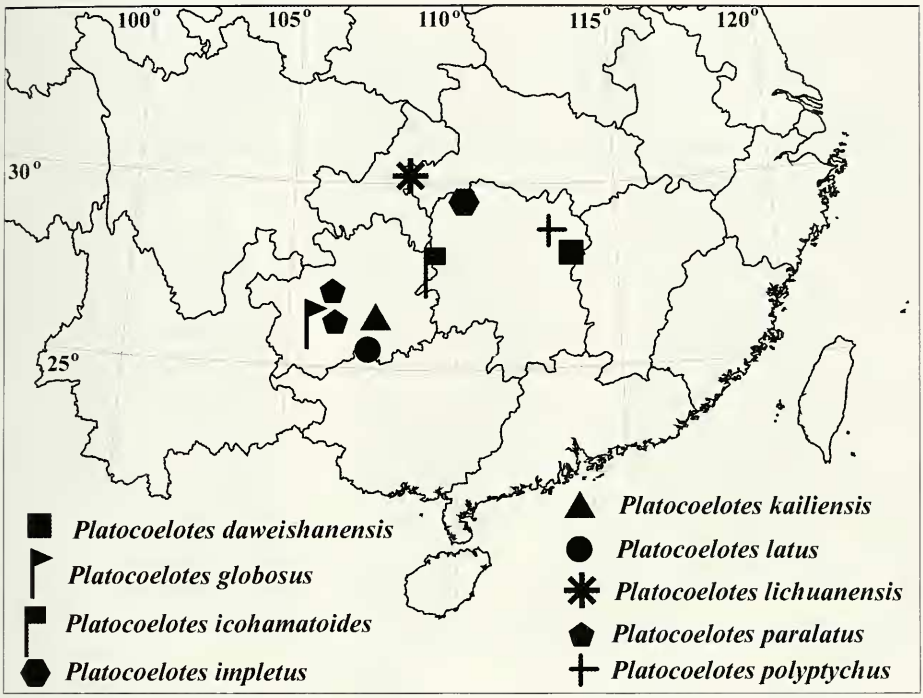
Platocoelotes Wang, 2002: 119. – Wang, 2003: 561.

Diagnosis: Male palpal organ without median apophysis and with ventral conductor apophysis; two patellar apophyses and a dorsal conductor apophysis present in most species; cymbial furrow length varying from less than one third to more than two thirds of cymbium length. Epigynum without epigynal teeth; epigynal hoods distinct, situated close to or widely apart from epigastric furrow; genital atrium large and shallow; spermathecae strongly convoluted or simple and globose; spermathecal heads and copulatory ducts small in most species.

Distribution: China (Guizhou, Hubei, Hunan, Sichuan) (Map 1).

Key to the species of the genus *Platocoelotes*:

1a Males (those of *P. globosus* and *P. icohamatoides* unknown) 2
1b Females (those of *P. lichuanensis* unknown) 8
2a Conductor strongly modified and forming a large cavity 3
2b Conductor not forming a large cavity 4
3a Ventral conductor apophysis short and blunt . . . . . *paralatus* sp. n.
3b Ventral conductor apophysis long and slender . . . . . *latus* sp. n.
4a Conductor deeply bifid . . . . . *polyptychus*
4b Conductor not bifid 5
5a Apical conductor apophysis present 6
5b Apical conductor apophysis absent . . . . . *daweishanensis* sp. n.
6a Apical conductor apophysis large . . . . . *lichuanensis*
6b Apical conductor apophysis small 7
7a Embolus with base extending posteriorly . . . . . *kailiensis*
7b Embolus with base extending prolaterally . . . . . *impletus*
8a Atrium with atrial septum . . . . . *polyptychus*
8b Atrium without atrial septum 9



MAP 1
Records of nine *Platocoelotes* species in southern China.

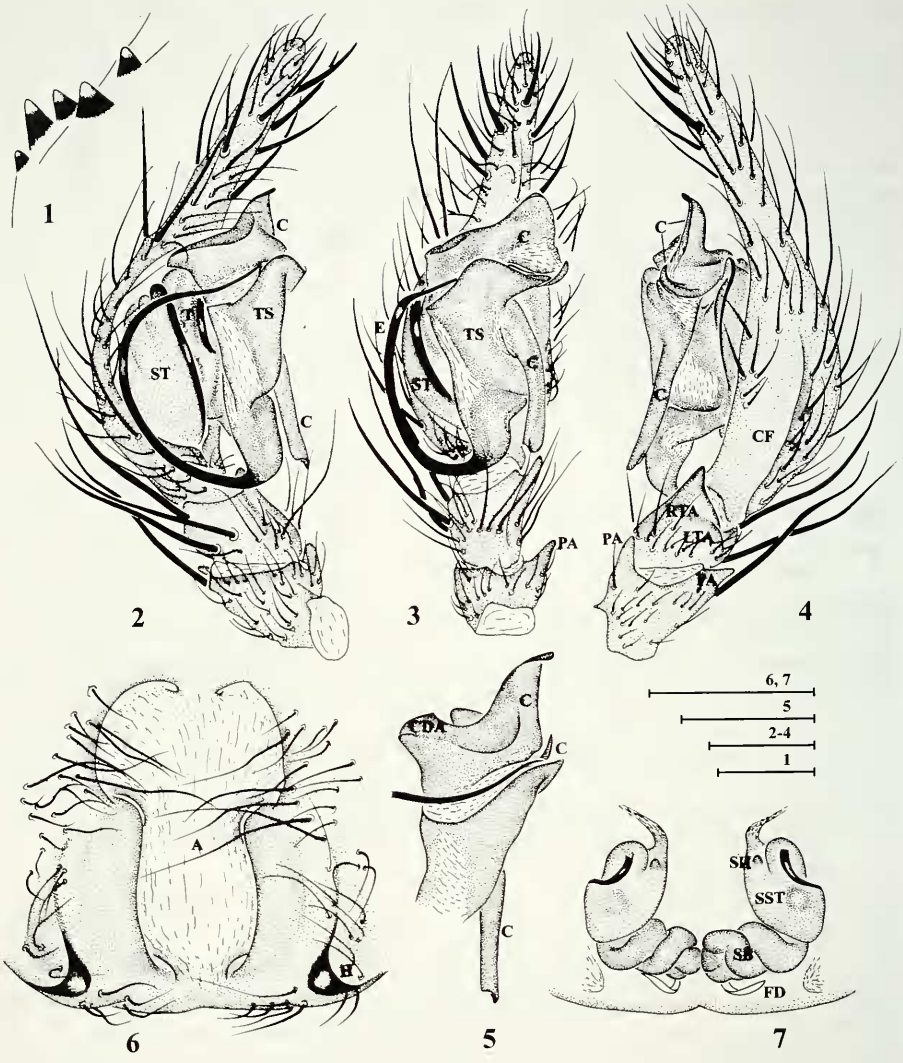
9a Epigynal hoods close to the epigastric furrow 10
9b Epigynal hoods situated mesally and widely separated from the epigastric furrow 12
10a Posterior atrium broad . . . . . *daweishanensis* sp. n.
10b Posterior atrium narrow 11
11a Spermathecal stalks extremely long, with at least five loops . . . . . *kailiensis*
11b Spermathecal stalks moderately long, with three or four loops . . *icohamatoides*
12a Lateral atrial margins anteriorly diverging and posteriorly converging . . . . . *globosus* sp. n.
12b Lateral atrial margins parallel or slightly diverging posteriorly 13
13a Spermathecal heads situated laterally . . . . . *latus* sp. n.
13b Spermathecal heads situated posteriorly . . . . . *paralatus* sp. n.

***Platocoelotes daweishanensis* sp. n.** Figs 1- 7

HOLOTYPE ♂ (IZCAS): Mt Daweishan, Liuyang County (28.1°N, 113.6°E), Hunan Province, China, collected by Xiang Xu, October 6, 2005.

PARATYPES: 1 ♀ (IZCAS) and 1 ♀ (MHNG), same locality as for the holotype, collected by Xiang Xu and Yufa Luo, October 7, 2005.

ETYMOLOGY: The specific name is an adjective derived from the name of the type locality.



FIGS 1-7

Platocoelotes daweishanensis sp. n., male holotype (1-5), female (6-7). (1) Cheliceral teeth, posterior view. (2) Palp, prolateral view. (3) Palp, ventral view. (4) Palp, retrolateral view. (5) Conductor, prolateral view. (6) Epigynum, ventral view. (7) Vulva, dorsal view. Scale lines: 1 = 0.2 mm; 2-7 = 0.5 mm.

DIAGNOSIS: The new species can be distinguished from all other *Platocoelotes* by the flat distal margin of its conductor and by the longitudinally extended spermathecal stalks which are abruptly turning back distally.

DESCRIPTION: Male (holotype). Total length 8.3. Carapace length 4.2, width 2.8; abdomen length 4.1, width 2.2. Eye measurements: AME 0.15; ALE 0.23; PME 0.18;

PLE 0.23; AME-AME 0.08; AME-ALE 0.03; ALE-PLE 0; PME-PME 0.13; PME-PLE 0.15. Clypeus height 0.13. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 18.5 (4.8, 6.0, 4.8, 2.9); II: 16.3 (4.5, 5.2, 4.1, 2.5); III: 14.5 (4.0, 4.3, 4.0, 2.2); IV: 19.6 (5.2, 6.1, 5.8, 2.5). ALE in contact with PLE. Chelicerae with three promarginal and two retromarginal teeth (Fig. 1). Palp with two widely separated patellar apophyses (Fig. 4); RTA with its distal end extending beyond the distal margin of the tibia; LTA wide; cymbial furrow less than half of cymbium length (Fig. 4); distal margin of conductor flat (Fig. 3); dorsal conductor apophysis situated prolaterally (Fig. 5); ventral conductor apophysis long, strongly extended proximally and almost reaching the distal end of the RTA (Figs 2-4); median apophysis absent; embolus long, proximal in origin (Fig. 3).

Female. A specimen of total length 6.1 measures: Carapace length 2.9, width 1.9; abdomen length 3.2, width 1.9. Eye measurements: AME 0.10; ALE 0.18; PME 0.15; PLE 0.17; AME-AME 0.08; AME-ALE 0.03; ALE-PLE 0; PME-PME 0.10; PME-PLE 0.10. Clypeus height 0.10. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 9.8 (2.7, 3.4, 2.2, 1.5); II: 8.4 (2.4, 2.8, 1.9, 1.3); III: 7.8 (2.1, 2.5, 2.0, 1.2); IV: 10.7 (2.8, 3.4, 3.0, 1.5). Genital atrium large, becoming slightly narrower posteriorly; epigynal hoods distinct, situated close to the epigastric furrow and widely separated from the lateral atrial margins (Fig. 6); copulatory ducts small, originating anteriorly in the genital atrium; spermathecal bases situated close to each other, twisted and elongated horizontally; spermathecal stalks elongated longitudinally and abruptly turning back distally; spermathecal heads small (Fig. 7).

VARIATION: The total lengths of the two females examined are 6.1 and 9.4.

DISTRIBUTION: China (Hunan) (Map 1).

***Platocoelotes globosus* sp. n.** Figs 8-10

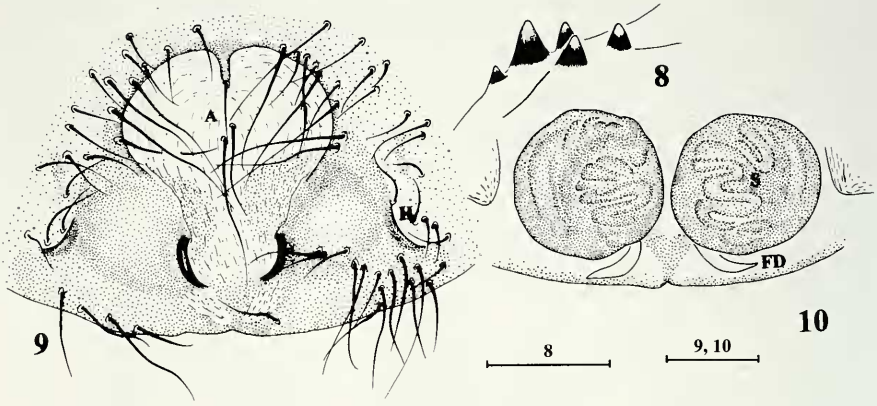
HOLOTYPE ♀ (IZCAS): Xianglushandong Cave, Caiguan Town, Anshun County (26.3°N, 106.0°E), Guizhou Province, China, collected by Yanfeng Tong, April 29, 2005.

PARATYPE: 2 ♀ (IZCAS) and 2 ♀ (MHNG), same data as for the holotype.

ETYMOLOGY: The specific name is taken from the Latin adjective *globosus* and refers to the globular spermathecae of this species.

DIAGNOSIS: Females of this new species can be distinguished from other *Platocoelotes* by their rounded spermathecae and indistinct spermathecal heads.

DESCRIPTION: Female (holotype). Total length 6.4. Carapace length 3.2, width 2.1; abdomen length 3.2, width 2.2. Eye measurements: AME 0.18; ALE 0.23; PME 0.18; PLE 0.18; AME-AME 0.08; AME-ALE 0.04; ALE-PLE 0; PME-PME 0.10; PME-PLE 0.15. Clypeus height 0.15. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 10.7 (2.9, 3.6, 2.6, 1.6); II: 9.6 (2.6, 3.1, 2.4, 1.5); III: 8.5 (2.3, 2.6, 2.3, 1.3); IV: 11.2 (2.9, 3.5, 3.3, 1.5). ALE in contact with PLE. Chelicerae with three promarginal and two retromarginal teeth (Fig. 8). Genital atrium large, anterior margin two times as wide as posterior margin; epigynal hoods widely separated from lateral atrial margin and slightly separated from the epigastric furrow (Fig. 9); spermathecae simple, globose; spermathecal heads absent; copulatory ducts not visible (Fig. 10).



FIGS 8-10

Platocoelotes globosus sp. n., female holotype. (8) Cheliceral teeth, posterior view. (9) Epigynum, ventral view. (10) Vulva, dorsal view. Scale lines: 8-10 = 0.2 mm.

Male. Unknown.

VARIATION: The total length varies from 6.4 to 6.9 in the five females examined.

DISTRIBUTION: China (Guizhou) (Map 1).

***Platocoelotes latus* sp. n.** Figs 11-16

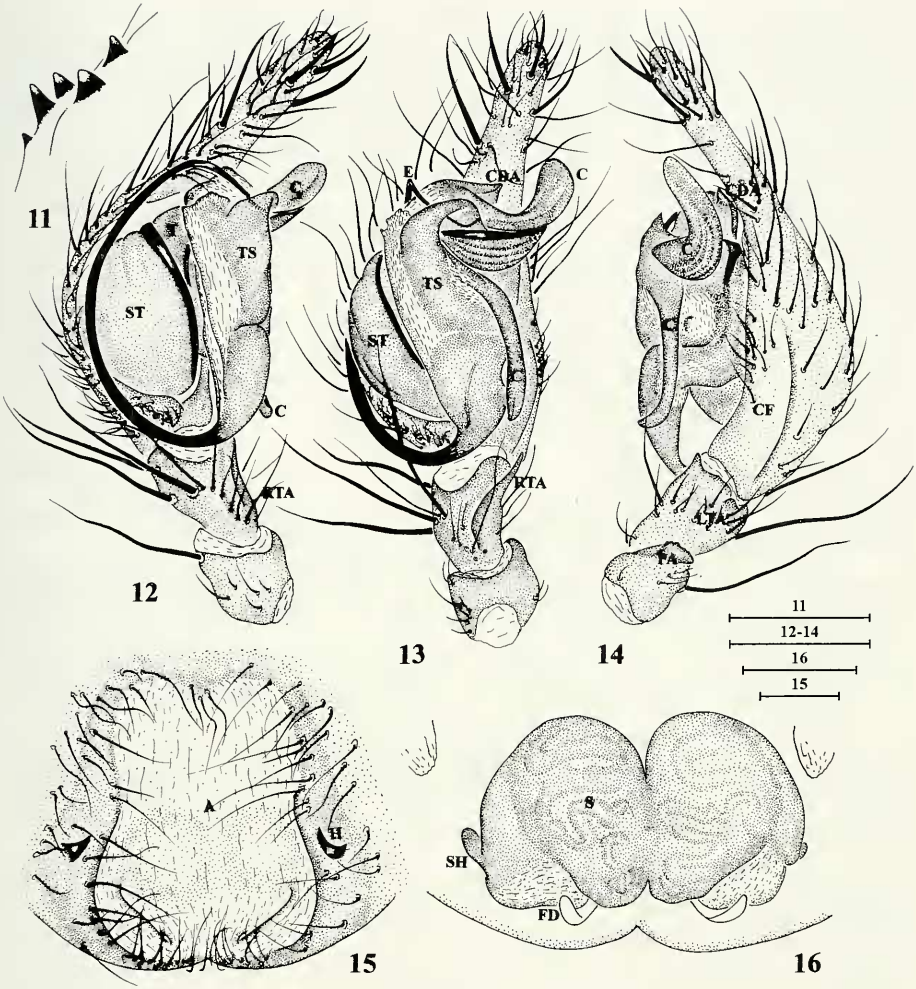
HOLOTYPE ♂ (IZCAS): Huoyaodong Cave, Xiasi Town, Dushan County (25.5°N, 107.4°E), Guizhou Province, China, collected by Yanfeng Tong, May 20, 2005.

PARATYPES: 3 ♀ (IZCAS), same data as for the holotype. – 1 ♂ (MHNG), Shenxiandong Cave, Bajing Village, Xiasi Town, Dushan County, Guizhou Province, China, collected by Yanfeng Tong, May 20, 2005. – 1 ♀ (MHNG), a cave without name, Yangjiao Village, Xiasi Town, Dushan County, Guizhou Province, China, collected by Yanfeng Tong, May 24, 2005.

ETYMOLOGY: The specific name is taken from the Latin adjective *latus*, meaning broad; it refers to the broad female genital atrium of this species.

DIAGNOSIS: The new species is similar to *Platocoelotes daweishanensis* sp. n. in having a long ventral conductor apophysis and a large genital atrium, but males can be distinguished by the presence of a single patellar apophysis and by the modified and unique conductor which possesses a large cavity; females are distinguished by the epigynal hoods that are situated close to the lateral atrial margin and widely separated from the epigastric furrow, by the anterior margin of the genital atrium that is almost equal in width to the posterior margin, by the simple and fused spermathecae and by the large spermathecal heads.

DESCRIPTION: Male (holotype). Total length 5.9. Carapace length 2.9, width 2.0; abdomen length 3.0, width 2.0. Eye measurements: AME 0.13; ALE 0.17; PME 0.15; PLE 0.17; AME-AME 0.06; AME-ALE 0; ALE-PLE 0; PME-PME 0.06; PME-PLE 0.08. Clypeus height 0.05. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 12.0 (3.1, 3.9, 3.0, 2.0); II: 10.3 (2.8, 3.2, 2.6, 1.7); III: 9.8 (2.5, 3.0, 2.8, 1.5); IV: 13.2 (3.4, 3.9, 4.0, 1.9). AME and PLE in contact with ALE. Chelicerae with



FIGS 11-16

Platocoelotes latus sp. n., male holotype (11-14), female (15, 16). (11) Cheliceral teeth, posterior view. (12) Palp, prolateral view. (13) Palp, ventral view. (14) Palp, retrolateral view. (15) Epigynum, ventral view. (16) Vulva, dorsal view. Scale lines: 11, 15, 16 = 0.2 mm; 12-14 = 0.5 mm.

three promarginal and two retromarginal teeth (Fig. 11). Patellar apophysis thumb-shaped (Fig. 14); RTA with its distal end sharp and extending beyond distal margin of tibia; LTA small, widely separated from RTA (Fig. 14); cymbial furrow less than half of cymbium length (Figs 13, 14); conductor modified, forming a large medio-distal cavity and slight terminal extension (Figs 12, 13); dorsal conductor apophysis small (Fig. 14); ventral conductor apophysis long and strongly extended posteriorly (Figs 13, 14); median apophysis strongly reduced, vestige visible (Fig. 14); embolus long, proximal in origin (Figs 12, 13).

Female. A specimen of total length 6.1 measures. Carapace length 3.2, width 2.2; abdomen length 2.9, width 1.8. Eye measurements: AME 0.13; ALE 0.15; PME 0.15; PLE 0.18; AME-AME 0.09; AME-ALE 0.04; ALE-PLE 0; PME-PME 0.11; PME-PLE 0.06. Clypeus height 0.15. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 11.1 (2.9, 3.8, 2.7, 1.7); II: 9.5 (2.6, 3.1, 2.3, 1.5); III: 8.9 (2.4, 2.8, 2.4, 1.3); IV: 11.8 (3.1, 3.8, 3.2, 1.7). Genital atrium large, occupying two thirds of epigynum; epigynal hoods situated mesally, close to the lateral atrial margin (Fig. 15); spermathecae simple and medially fused to each other; spermathecal heads situated laterally, widely separated from each other; copulatory ducts small; fertilization ducts widely separated (Fig. 16).

VARIATION: The total length in the two males examined is 5.7 and 5.9, and it varies from 5.5 to 7.3 in the four females examined.

DISTRIBUTION: China (Guizhou) (Map 1).

***Platocoelotes paralatus* sp. n.** Figs 17-22

HOLOTYPE ♂ (IZCAS): Guanyin Cave, Jinbi Town, Qianxi County (26.9°N, 106.0°E), Guizhou Province, China, collected by Yanfeng Tong, May 18, 2005.

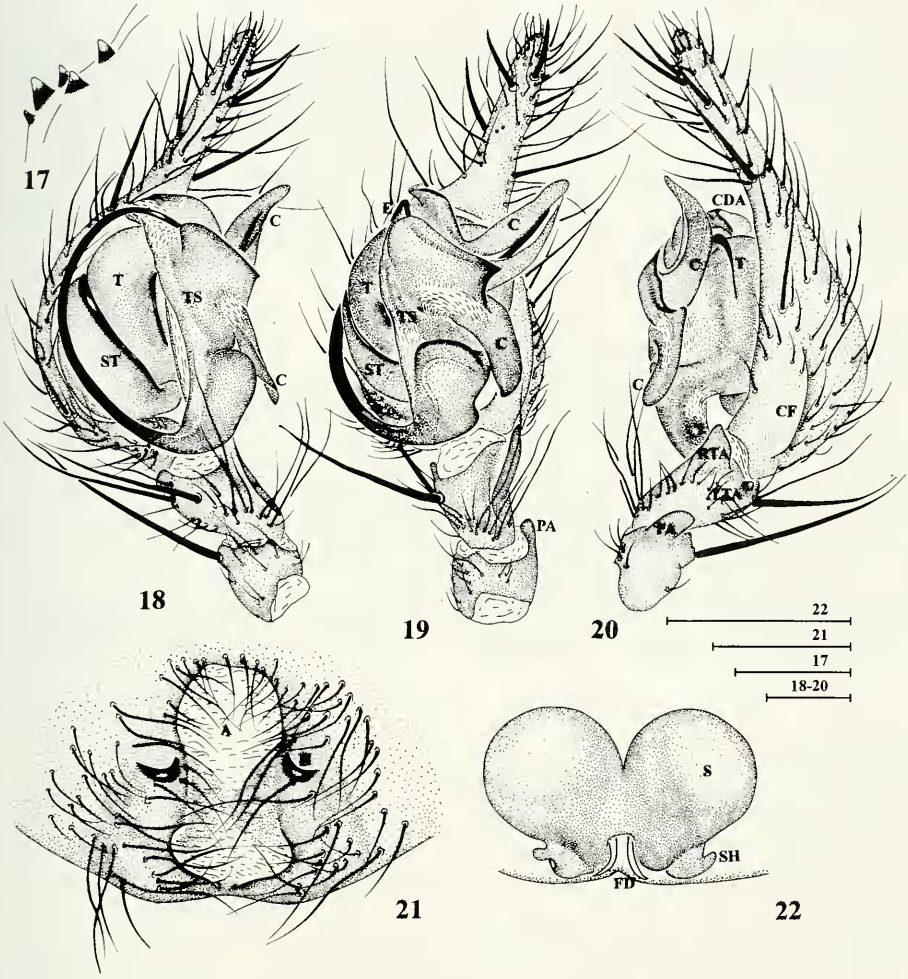
PARATYPES: 4 ♀ (MHNG), same data as for the holotype; 8 ♀ (IZCAS), Xianglushan Cave, Caiguan Town, Anshun County (26.3°N, 106.0°E), Guizhou Province, China, collected by Yanfeng Tong, April 29, 2005.

ETYMOLOGY: The specific name is a compound word of the Greek prefix "*para*" and the Latin adjective "*latus*", referring to similarities with *Platocoelotes latus* sp. n.

DIAGNOSIS: The new species is similar to *Platocoelotes latus* sp. n. in the shape of its conductor, the presence of a large genital atrium and simple, fused spermathecae, but can be distinguished by its narrower atrium, short and blunt ventral conductor apophysis and fertilization ducts situated close to each other.

DESCRIPTION: Male (holotype). Total length 5.5. Carapace length 2.6, width 2.2; abdomen length 2.9, width 1.9. Eye measurements: AME 0.15; ALE 0.20; PME 0.15; PLE 0.18; AME-AME 0.03; AME-ALE 0; ALE-PLE 0; PME-PME 0.05; PME-PLE 0.08. Clypeus height 0.13. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 13.2 (3.4, 4.3, 3.4, 2.1); II: 11.5 (3.1, 3.6, 3.0, 1.8); III: 10.6 (2.8, 3.2, 3.0, 1.6); IV: 13.6 (3.6, 4.0, 3.9, 2.1). AME and PLE in contact with ALE. Chelicerae with three promarginal teeth and two retromarginal teeth (Fig. 17). Patellar apophysis large (Fig. 20); RTA with its distal end slightly extending beyond distal margin of tibia; LTA small (Fig. 20); cymbial furrow about one third of cymbium length (Fig. 20); conductor modified, forming a long medio-distal cavity (Fig. 19); proximal conductor margin with a sharp tooth (Fig. 19); dorsal conductor apophysis small (Fig. 20); ventral conductor apophysis short and blunt; tegular sclerite small (Fig. 19); embolus long, proximal in origin (Figs 18, 19).

Female. A specimen of total length 5.5 measures: Carapace length 2.3, width 1.6; abdomen length 3.2, width 2.6. Eye measurements: AME 0.10; ALE 0.15; PME 0.13; PLE 0.15; AME-AME 0.03; AME-ALE 0; ALE-PLE 0; PME-PME 0.04; PME-PLE 0.09. Clypeus height 0.10. Leg IV longest; leg formula: IV, I, II, III; leg measurements as follows: I: 9.4 (2.6, 3.1, 2.2, 1.5); II: 7.9 (2.3, 2.5, 1.9, 1.2); III: 7.0



FIGS 17-22

Platocoelotes paralatus sp. n., male holotype (17-20), female (21, 22). (17) Cheliceral teeth, posterior view. (18) Palp, prolateral view. (19) Palp, ventral view. (20) Palp, retrolateral view. (21) Epigynum, ventral view. (22) Vulva, dorsal view. Scale lines: 17-20 = 0.2 mm; 21-22 = 0.5 mm.

(1.9, 2.1, 1.9, 1.1); IV: 9.8 (2.6, 3.0, 2.8, 1.4). Genital atrium large, occupying half of epigynum; epigynal hoods situated mesally, close to the lateral atrial margin (Fig. 21); copulatory ducts not visible; spermathecae simple and medially fused to each other; spermathecal heads small, situated posteriorly and widely separated from each other; fertilization ducts situated close to each other (Fig. 22).

VARIATION: The total length varies from 3.6 to 5.5 in the twelve female examined.

DISTRIBUTION: China (Guizhou) (Map 1).

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